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IS 7028-8 (2002): Performance Tests for Complete, Filled Transport Packages, Part 8: Water Spray Test [TED 24: Transport Packages]

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पूरे भरित परिवहन पैकेज का कार्यकारिता परीक्षण

भाग 8 जल फुहार परीक्षण

(दूसरा पुनरीक्षण)

Indian Standard

PERFORMANCE TESTS FOR COMPLETE, FILLED TRANSPORT PACKAGES

PART 8 WATER SPRAY TEST

(Second Revision)

ICS 55.180.40

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BUREAU OF INDIAN STANDARDS
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NEW DELHI 110002

July 2002

Price Group 3

Transport Packages and Packaging Codes Sectional Committee, TED 24

FOREWORD

This Indian Standard (Part 8) (Second Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by Transport Packages and Packaging Codes Sectional Committee had been approved by the Transport Engineering Division Council.

This standard was first published in 1974 and was revised in 1987. The second revision has been undertaken to bring it in line with ISO 2875 : 2000 'Packaging — Complete, filled transport packages and unit loads — Water spray test (*third revision*)' issued by the International Organization for Standardization (ISO).

In this revision the following technical changes have been incorporated:

a) Concept of unit load has been added.

b) Clause on Sprays has been revised which includes Method A (continuous spraying) and Method B (intermittent spraying).

c) Figure of the apparatus for the 'Water Spray Test' has been given.

d) Clause on 'Apparatus' changed to 'Apparatus and Conditions' to include the 'Test Area Conditions'.

The composition of the Committee responsible for formulation of this standard is given in Annex A.

Indian Standard

PERFORMANCE TESTS FOR COMPLETE, FILLED TRANSPORT PACKAGES

PART 8 WATER SPRAY TEST

(Second Revision)

1 SCOPE

1.1 This standard (Part 8) specifies a method for testing the resistance of a complete, filled transport package or a unit load to water spray or the protection it gives to its contents from water spray. It may also be used to precondition a complete, filled transport package or a unit load prior to another test to investigate reduction in strength caused by exposure to water.

1.2 The test is performed on the test specimen as prepared for transport and may form part of a test sequence.

2 REFERENCES

The following standards contain provisions which through reference in this text, constitute provision of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below:

IS No.	*Title*
7030 : 1988	Identification of parts for complete, filled transport packages when testing (*first revision*)
7031 : 2002	Method of conditioning for testing of complete, filled transport packages (*second revision*)

3 TERMINOLOGY

3.1 For the purposes of this standard, the following term and definition shall apply.

3.1.1 *Test Specimen* — A complete, filled transport package or unit load.

4 PRINCIPLE

4.1 The test specimen is placed in a test area and its top surface sprayed with water maintained at a constant temperature at a specified rate for a specified period. Each area of the surface is sprayed either continuously (Method A) or intermittently (Method B).

5 APPARATUS AND CONDITIONS

5.1 Test area conditions, shall be as follows.

5.1.1 *Insulated and Heated*

When necessary, to allow temperature to be controlled, fitted with a floor grating and an outlet of sufficient capacity to drain off the water as it is sprayed so that the test specimen does not stand in a pool of water. The grating shall not, through lack of rigidity or having too wide a mesh, cause deformation of the test specimen.

5.1.2 *Height*

Sufficient to give a distance of at least 2 m between the spray nozzles (*see* **5.2**) and the nearest point on the test specimen, so that the drops fall vertically. The dimensions of the floor shall be at least 50 percent greater than those of the base of the test specimen.

5.2 Sprays

Adjustable in height and fitted with nozzles of a design allowing water to fall vertically at a rate of 100 ± 20 l/m^2h onto a horizontal area 2 m below the nozzles, sufficiently uniform to meet the requirements of the calibration test in **8.1**, arranged in accordance with Method A or Method B as given below.

5.2.1 *Method A (Continuous Spraying)*

An array of sprays, fixed in position above the test specimen, after adjusting for height.

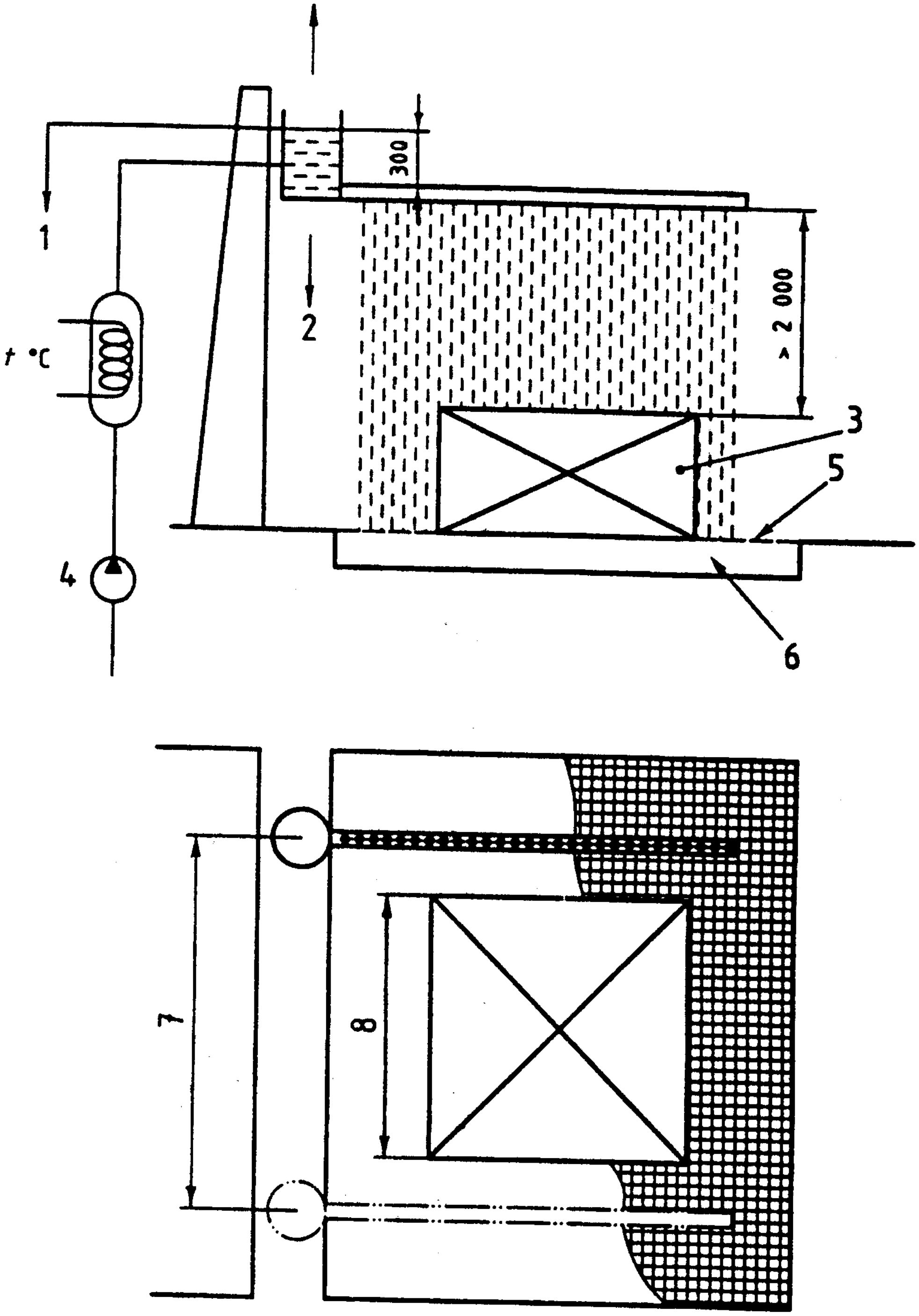
5.2.2 *Method B (Intermittent Spraying)*

A row or rows of sprays across the width of the test specimen, capable of traversing a distance greater than the length of the test specimen at a constant velocity to meet the requirements of **8.1**, with the interval between successive spraying being less than 30 s.

5.3 Water Supply System

Supplying water at the required temperature (within a range of 5°C and 30°C) and at the rate and pressure required by the spray nozzles (*see* **5.2**).

NOTE — Fig. 1 shows an example of apparatus configured appropriately for the operation of these tests.



Key

1	Overflow
2	Height adjustment
3	Test specimen
4	Circulating pump or network
5	Grating
6	Drain
7	Travel of the upper spray
8	Test specimen dimensions

All dimensions in millimetres.

FIG. 1 APPARATUS FOR WATER SPRAY TEST

6 TEST SPECIMEN PREPARATION

Fill the test specimen with its intended contents and ensure that the test specimen is closed normally, as if ready for distribution.

NOTE — Simulated or substitute contents may be used on condition that the dimensions and physical properties of such contents are as close as possible to those of the intended contents. The closure should still be as for distribution.

7 CONDITIONING

The package shall be conditioned in accordance with one of the conditions described in IS 7031.

8 PROCEDURE

8.1 Calibration

8.1.1 The sprays (*see* **5.2**) shall be mounted 2 m above the surface of the floor, with nozzles directed vertically downwards.

8.1.2 Sufficient identical open-top containers, of a design having an aperture area between 0.25 m^2 and 0.5 $m^2$and height between 0.25 m and 0.5 m, shall be placed uniformly on the surface of the floor to cover at least 25 percent of its area.

8.1.3 The sprays shall then be turned on and the time taken for the first and last containers to fill to overflowing shall be measured.

8.1.4 The time taken for the first to overflow shall not exceed that represented by a rate of 120 l/m^2 h; that of the least shall not be less than that represented by 80 l/m^2 h.

8.2 Test

8.2.1 Adjust the height of the sprays (*see* **5.2**) to give a vertical distance of at least 2 m between the spray nozzles and the nearest point on the test specimen. Operate the sprays until the entire system has reached equilibrium. Unless otherwise specified, the temperature of the spray water and test area (*see* **5.1**) shall be between 5°C and 30°C.

8.2.2 Place the test specimen centrally in the test area, in the predetermined position and at the predetermined temperature so that the water falls vertically on the test specimen. Operate the sprays continuously, as calibrated, for the specified period.

8.2.3 Examine the test specimen and its contents for any reduction in protective properties and/or infiltration of water.

9 TEST REPORT

The test report shall include:

a) a reference to this standard;

b) the name and address of testing laboratory and the name and address of the customer;

c) the unique identification of the report;

d) the date of receipt of the test specimens and the date(s) of performance of the test;

e) the name, title and signature of persons accepting test responsibility for the test report;

f) a statement to the effect that the test results relate only to the specimens tested;

g) a statement that the report shall not be reproduced except in full without the written approval of the testing laboratory;

h) the number of replicate test specimens tested;

j) a full description including dimensions, structural and material specifications of the test specimen and its fittings, cushioning, blocking, closure or reinforcing arrangements, gross mass of the test specimen and mass of the contents in kilograms;

k) a description of the contents and if simulated or substituted contents were used, full details shall be given;

m) the relative humidity, the temperature and time of conditioning, and whether these values comply with the requirements of IS 7031;

n) the method used (A or B);

p) the attitudes in which the test specimen was tested, using the method of identification given in IS 7030;

q) the temperature of test area and of the water at time of test;

r) the duration of the test;

s) any deviation from the test method described in this standard; and

t) a record of the result, including any observations which assist in the correct interpretation of the results.

ANNEX A

(Foreword)

COMMITTEE COMPOSITION

Transport Packages and Packaging Codes Sectional Committee, TED 24

Organization	*Representative(s)*
Indian Institute of Packaging, Mumbai	Shri P. V. Narayanan (***Chairman***)
Advance Packaging Pvt Ltd, Mumbai	Shri Damodar Somani
Association of Small Tool Manufacturers, Chennai	Shri S. Rajagopalan Shri M. S. Balachandran (*Alternate*)
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Bharat Electronics Ltd, Bangalore	Shri S. A. Rao
Bharat Heavy Electrical Ltd, Hyderabad	Shri Ravi Chander Shri M. S. Singewad (*Alternate*)
Containers Corporation of India Ltd, New Delhi	Shri S. C. Gupta
Department of Explosives, Nagpur	Shri A. S. Ghoshal Shri G. M. Arma (*Alternate*)
Department of Telecommunication, New Delhi	Assistant Director General (SL) Assistant Director General (ST) (*Alternate*)
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Electronics Corporation of India Ltd, Hyderabad	Shri G. V. Deenadayal Shri P. P. Singh (*Alternate*)
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India Foils Ltd, Kolkata	Shri B. Mallick Shri M. K. Chakraborty (*Alternate*)
Indian Aluminium Co Ltd, Mumbai	Shri M. S. Verma Shri B. Balagopal (*Alternate*)

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(*Continued from page* 5)

Organization	*Representative(s)*
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Indian Institute of Packaging, Mumbai	DR N. G. MOKASHI
ITC Ltd, Kolkata	DR P. P. SINGH SHRI C. T. DHRUVA KRISHNAN (*Alternate*)
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The Supreme Industries Ltd, Mumbai	SHRI V. SHANKAR SHRI MUKESH SHAH (*Alternate*)
WIPRO Ltd, Mumbai	SHRI P. S. PAI
BIS Directorate General	SHRI A. R. GULATI, Director & Head (TED) [Representing Director General (*Ex-officio*)]

Member-Secretary
SHRI P. K. SHARMA
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This Indian Standard has been developed from Doc : No. TED 24 (326).

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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Printed at New India Printing Press, Khurja, India